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Energy Observatory
JOURNAL

April 2024

Renewable Energy News

Saudi Arabia and Spain strengthen collaboration in urban infrastructure and renewable energy sector

Saudi Arabia's Minister of Municipal, Rural Affairs, and Housing, Majed Al-Hogail, met with Pedro Fernandez Allen, president of the National Union of Building and Construction. SPA

Saudi Arabia is looking to enhance its collaboration with Spain in urban infrastructure, renewable energy, and engineering technology, following high-level meetings in Madrid. During his visit, Saudi Minister Majed Al-Hogail engaged with top Spanish executives to discuss energy efficiency, sustainable development, and digital transformations in municipal services.

This partnership, part of Saudi Arabia's Vision 2030, aims to improve housing and infrastructure while boosting non-oil GDP contributions. Significant Spanish investments in Saudi real estate underline these strategic ties, with further plans to expand housing units significantly by 2030, enhancing both nations' economic collaboration.

Source

Renewable Energy News

Saudi Arabia Showcases its National Programs, Initiatives, and Global Contributions at the World Energy Congress in Netherlands

Image: moenergy

The Kingdom of Saudi Arabia, represented by its energy industry, participates in the 26th World Energy Congress held in Netherlands from 22 to 25 April 2024. The Congress discusses a range of energy-related issues as well as the changes occurring in the crucial energy sector. It emphasizes the necessity of enhancing and improving the management of these changes in a way that is just, equitable, and environmentally responsible.

Saudi Arabia's attendance at the Congress highlights the country's major contributions and leadership position in the energy sector, which are demonstrated by a number of national projects and initiatives that are presented by a well-chosen panel of experts and professionals.

The Kingdom is organizing its own pavilion at the exhibition, which is taking place concurrently with the Congress and has as its theme "Sustainable Energy - Shared Future." The pavilion highlights Saudi Arabia's efforts to mitigate global climate change and highlights its status as one of the world's major energy hubs. The Kingdom of Saudi Arabia, through the Ministry of Energy, will organize and conduct the 27th World Energy Congress, which will be held in Riyadh, the capital city, from October 26 to 29, 2026.

Source

Renewable Energy News

China poised to reach 5.5 TW of solar by 2050

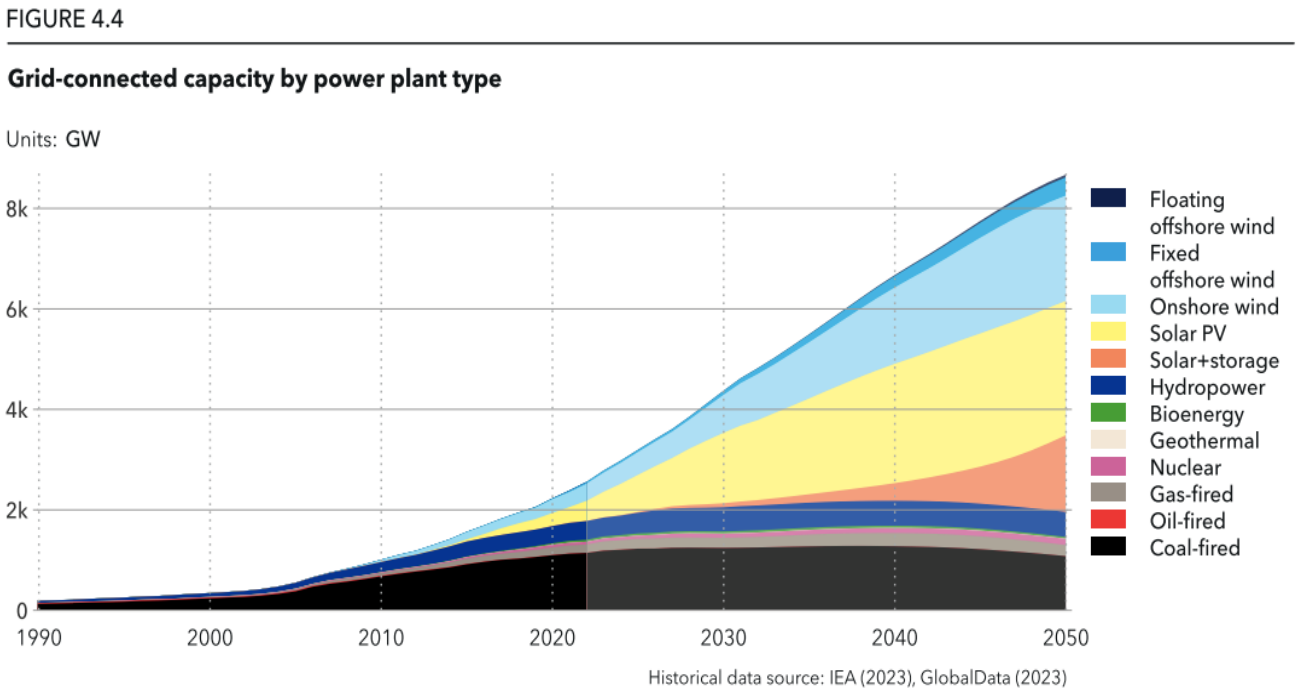


Image: DNV

According to DNV's "Energy Transition Outlook China 2024," China is expected to achieve 5.5 terawatts (TW) of solar capacity by 2050, with solar energy projected to constitute 38% of the country's electricity production. This growth includes 3.9 TW of solar and 1.6 TW of solar-plus-storage, driven by decreasing costs and supportive policies.

By 2050, 34% of solar capacity is anticipated to include storage, predominantly batteries, enhancing grid stability and efficiency. The expansion aligns with China's broader goal to transform its energy mix, significantly reducing reliance on fossil fuels and aiming for nearly net-zero emissions.

Source

Renewable Energy News

The Global Wind Report for the year 2023

FILE - Wind turbines operate on March 7, 2024, in Palm Springs, Calif. According to a new report published Tuesday, April 16, 2024, last year, marked the best year for new wind projects. (AP Photo/Ashley Landis, File)

The 2023 Global Wind Report highlights a record-breaking year with 117 gigawatts of new wind power capacity installed globally, signaling progress in the fight against climate change. However, meeting climate targets requires increased annual growth to 320 gigawatts by 2030. Despite challenges such as high upfront costs and grid integration issues, wind energy is gaining traction worldwide.

China led in installations, followed by the US, Brazil, and Germany. Emerging markets like Africa and the Middle East are witnessing significant growth, albeit with financing challenges. Nonetheless, the expanding wind industry suggests a promising future with established supply chains and improving technology.

Source

Renewable Energy News

1-GW wind, solar portfolio in Texas

Source: seagul, Pixabay

Nova Clean Energy, the North American renewable energy arm of Bluestar Energy Capital, has acquired HyFuels, a Texas-based renewables project featuring 1 gigawatt of wind and solar developments along with an early-stage green ammonia project. The complex, spanning 25,000 acres, will host two wind and two solar plants alongside a green ammonia site, expected to commence operations by 2026.

Previously developed by BNB Renewable Energy, Nova and BNB collaborated on the project since mid-2023. Nova aims to deploy 10 gigawatts of renewable power by 2030, building on its current pipeline of over 5 gigawatts across eight states and various markets.

Source

Renewable Energy News

leg crane development to support next-generation wind turbines

Credit: Mammoet/Jorrit Lousberg

Mammoet, in collaboration with GustoMSC and Cadeler, has developed new leg cranes for offshore wind farm installation vessels, Wind Orca and Wind Osprey, in Texas. These cranes, with a 1,600-ton lifting capacity and fully electrically driven, are designed to accommodate next-generation wind turbines surpassing 14 MW capacity.

Mammoet's PTC210-DS crane, one of the world's largest, facilitated this project, showcasing its versatility and efficiency. Mammoet's strategic use of its Schiedam yard enabled simultaneous work on both vessels, optimizing schedules and safety. This innovative project underscores Mammoet's commitment to advancing offshore wind energy infrastructure while prioritizing safety and efficiency.

Source

Nuclear Energy News

Indian net-zero will need nuclear, report finds

The report launch in New Delhi on 3 April (Press Bureau of India)

India's path to achieving clean, affordable electricity and net-zero emissions by 2070 hinges on substantial investments in nuclear power and renewable energy, according to a new report commissioned by the Indian government. The report, prepared by the Indian Institute of Management Ahmedabad (IIMA), outlines various pathways and scenarios for India's energy transition, emphasizing the need for a diversified energy mix and accelerated decarbonization of the electricity sector.

Coal is projected to remain a significant part of the energy mix in the near term, but the report underscores the importance of transitioning to non-fossil energy sources, including nuclear power. The report recommends creating a conducive policy environment and investing in research and development to facilitate the deployment of nuclear technologies. Additionally, it suggests measures such as establishing carbon pricing mechanisms and enhancing uranium storage facilities to support nuclear energy expansion.

Source

Nuclear Energy News

Industria and Rolls-Royce SMR plans take step forward

Rolls-Royce SMR's Woods and Industria's Ruman, pictured last year (Rolls-Royce SMR)

Poland's Industria has secured all necessary ministerial opinions to advance its plans for small modular reactor (SMR) plants using Rolls-Royce SMR technology. The opinions, obtained from various government departments, affirm the investment's positive impact. With these in hand, the Ministry of Climate and Environment can proceed to issue a Decision In Principle for deploying Rolls-Royce SMRs, a 470 MWe design based on a small pressurized water reactor.

This milestone marks progress toward fulfilling Poland's zero-emission energy goals, particularly within the Central Hydrogen Cluster initiative. Industria's President, Szczepan Ruman, emphasizes the importance of the positive opinions and anticipates the creation of attractive job opportunities in Poland through collaboration on SMR projects. Alan Woods, Rolls-Royce SMR's Director of Strategy and Business Development, expresses delight at the government's recognition of the potential benefits of deploying their nuclear power plants in Poland.

Source

Nuclear Energy News

Super module installed at first Lianjiang unit

The CA01 module is hoisted into place (Image: SNERDI)

The CA01 'super module' has been successfully installed at unit 1 of the Lianjiang nuclear power plant in China's Guangdong province, marking a significant milestone in the construction process. This massive concrete and steel module, weighing over 1000 tonnes and composed of 47 sub-modules, will house critical components such as the reactor pressure vessel and steam generators.

The installation process, completed on April 13, required meticulous planning and execution, lasting over 3 hours. Utilizing modular construction techniques, the CAP1000 reactor design enables the assembly of large structural modules off-site before installation. Once operational, the Lianjiang plant is expected to make a substantial contribution to China's power generation, significantly reducing coal consumption and emissions. It will also pioneer innovative cooling technologies, further enhancing its environmental sustainability.

Source

Nuclear Energy News

Japan Informs IAEA About Corrosion of Tanks Holding ALPS Treated Water, Confirms No Structural Impact or Risk to Safety

Image: IAEA

Tokyo Electric Power Company (TEPCO) of Japan, which operates the Fukushima Daiichi Nuclear Power Station (FDNPS), notified the International Atomic Energy Agency (IAEA) yesterday of the discovery of localized paint flaking and corrosion on three tanks used to hold treated water at the plant.

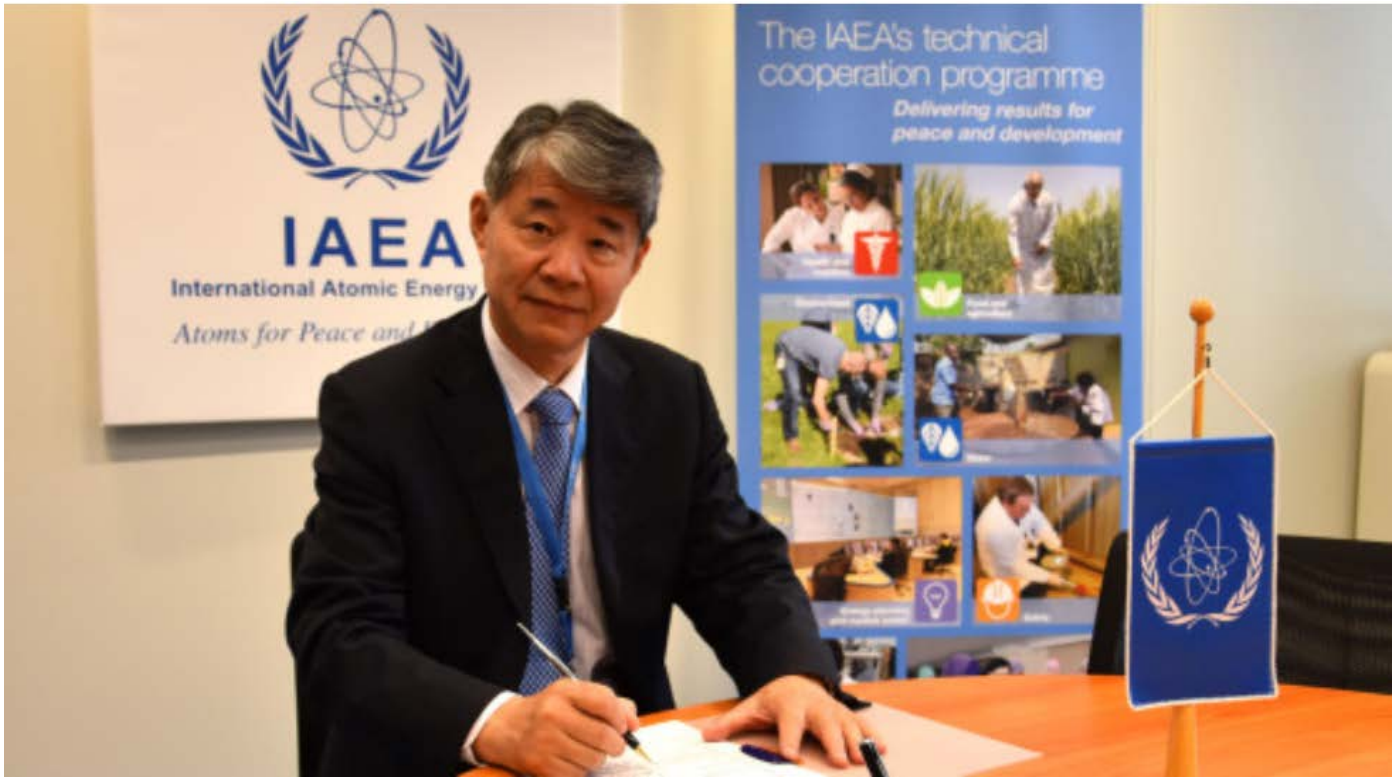
TEPCO personnel discovered corrosion and flaking on three of the tanks during a regular walkdown of the tanks that were emptied after the water was transferred. These tanks are utilized at FDNPS to store the treated water from the ALPS (Advanced Liquid Processing System). These three tanks are presently empty, and an examination found that no water had spilled and that the corrosion had no effect on the tanks' structural integrity.

There is no environmental effect and no safety concern associated with the rusting. The release of the treated water from ALPS had nothing to do with the incident. Before the tanks are used to hold ALPS treated water once more, the damaged area will be fixed. Japan's Nuclear Regulatory Authority has been informed, and inspectors at the plant are conducting an on-site investigation. The IAEA remains in contact with Nuclear Regulatory Authority in Japan.

Source

Nuclear Energy News

Uganda Signs its Fifth Country Programme Framework (CPF) for 2024-2029



Hua Liu, IAEA Deputy Director General and Head of the Department of Technical Cooperation, signed Uganda's Country Programme Framework (CPF) for the period of 2024-2029. (Photo: J. O'Brien/IAEA)

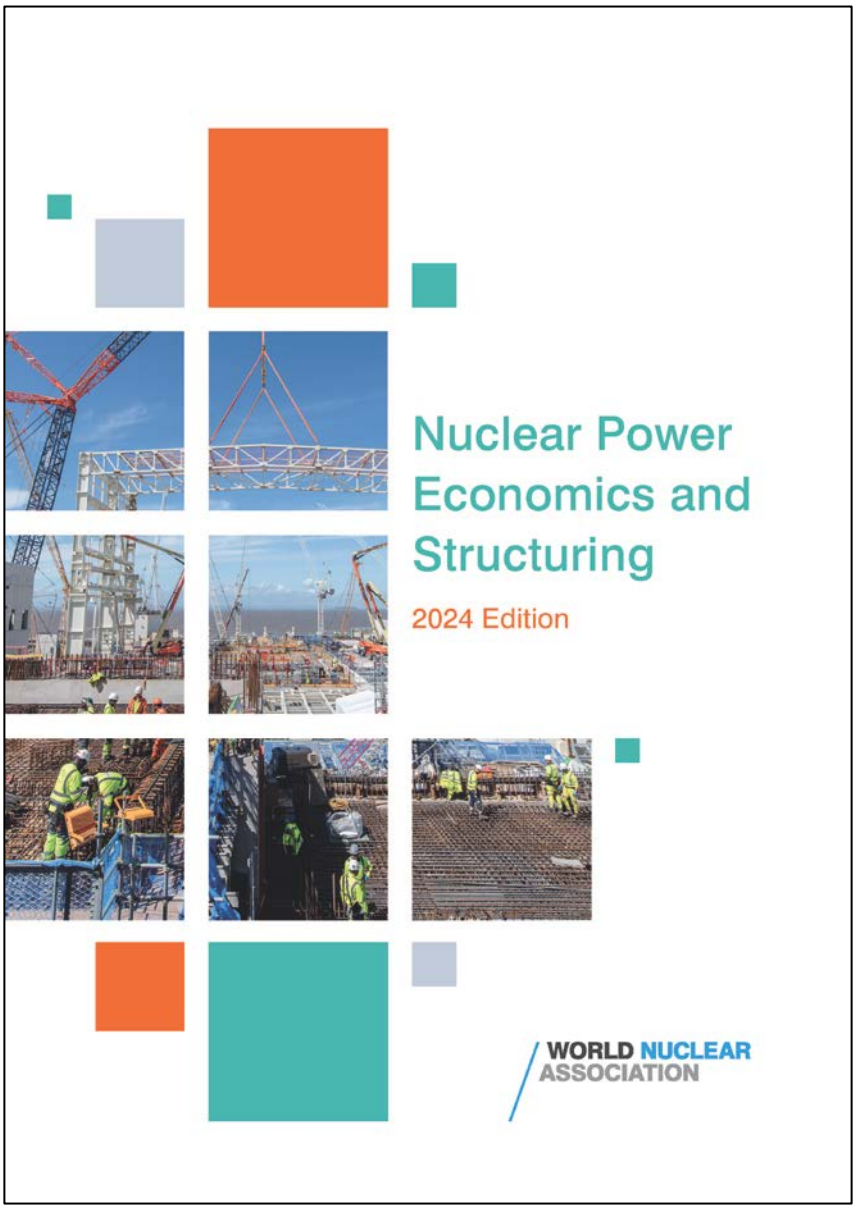
On February 16, 2024, Hua Liu, Deputy Director General of the IAEA and Head of the Department of Technical Cooperation, and Hon. Ruth Nankabirwa Ssentamu, Minister of Energy and Mineral Development, signed Uganda's Country Programme Framework (CPF) for the years 2024–2029.

A CPF specifies priority areas where the transfer of nuclear technology and resources for technical cooperation will be focused to meet national development goals. It serves as the framework for the medium-term planning of technical cooperation between a Member State and the IAEA. Uganda has been an IAEA Member State since 1967. Its 2024-2029 CPF identifies seven priority areas:

1. Nuclear and radiation safety
2. Food and agriculture
3. Human health
4. Water and the environment
5. Introduction of nuclear power
6. Uranium production
7. Feasibility studies on industrial applications such as: research reactor, industrial irradiator and non-destructive testing

Source

Report title: Nuclear Power: A Cornerstone for Sustainable Energy



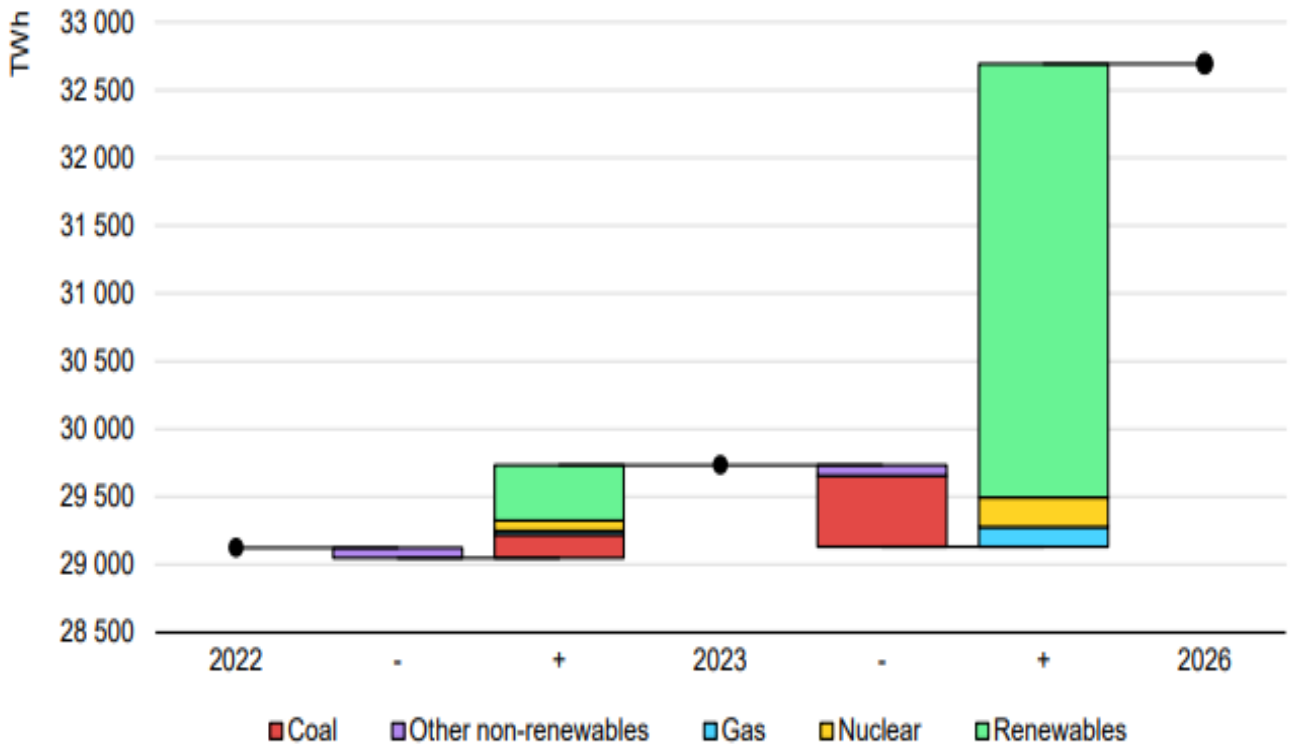
Unveiling insights from the "Nuclear Power Economics and Structuring 2024 Edition (WNA)" report by the World Nuclear Association, we find nuclear power's pivotal role in delivering dependable, low-carbon electricity. This in-depth analysis emphasizes its economic benefits and resilience to price volatility, highlighting alignment with sustainable development goals.

Despite challenges from renewables, nuclear power remains a competitive and indispensable element of the energy landscape. Explore the full report for comprehensive insights into nuclear power's vital contribution to combating climate change and ensuring energy security.

Prepared by: Talal Al Harbi

Source

Changes in global electricity generation of the years 2022-2026



Electricity 2024 report , IEA

Between 2022 and 2026, significant shifts are expected in the global electricity generation landscape. Renewables are projected to surpass coal as the largest electricity source by 2025, accounting for over one-third of global electricity generation. Low-carbon sources, including renewables and nuclear, are forecasted to contribute to 46% of global electricity generation by the end of 2026.

Moreover, low-carbon generation is anticipated to meet all additional demand growth up to 2026. Despite a subdued growth in renewable power generation in 2023 due to factors like droughts, a strong rebound is expected, with a 14% surge in 2024 and an average annual growth of 9% in 2025-2026. Global nuclear generation is also set to achieve a historical high in 2025, with an average growth of about 3% from 2024 to 2026, supported by various factors such as the recovery in French nuclear output and new plant installations worldwide.

Prepared by: Bandar Bahattab

Source

1. Technoeconomic analysis of standalone hybrid renewable energy systems for telecommunication sector under different climatic conditions in Saudi Arabia.

Furqan Asghar, M. Imtiaz Hussain, Fahad Abdullah Alshahrani , Muhammad Imran Akhtar , Waseem Amjad , Muhammad Shahzad , Syed Nabeel Husnain , Gwi Hyun Lee

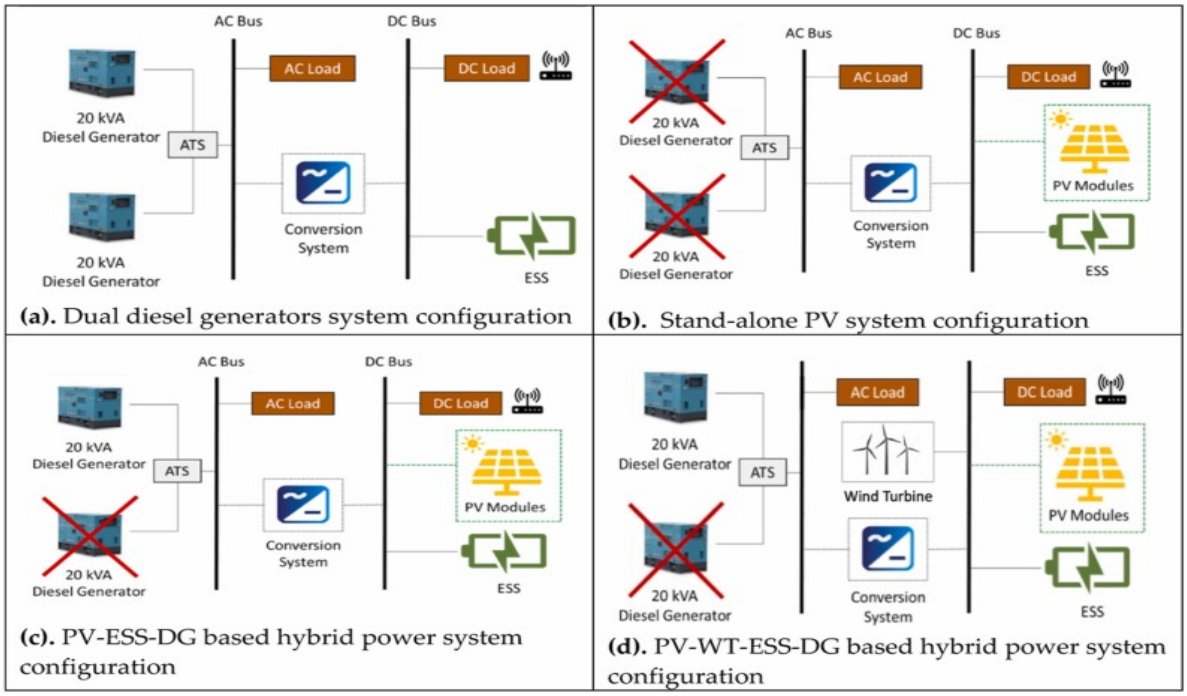


Fig. 9. Power System Configuration in Different Configurations for Telecom Site.

The increasing reliance on traditional fossil fuels to meet the growing energy demands of industrial development is becoming economically burdensome and a major contributor to global warming. Saudi Arabia, which holds nearly 15% of the world's oil reserves, faces a complex situation where about 53% of its government revenue is derived from oil, making it the world's 11th largest emitter of carbon gases. This situation highlights the critical need for a shift towards renewable energy sources to reduce environmental and economic risks. A considerable portion of the power generated conventionally is consumed by Saudi Arabia's telecommunications sector. Given rising costs, there is a pressing need for more efficient power use by telecom towers. Employing renewable energy sources to power these towers offers a sustainable solution, though careful consideration of technical, economic, and environmental factors is essential.

This study conducted a techno-economic analysis of a standalone hybrid energy system designed to meet the power needs of telecom towers in Saudi Arabia. The system's performance was evaluated against various economic and environmental criteria to determine its efficiency, reliability, cost-effectiveness, and impact on carbon emissions. Simulation results showed that the proposed system is economically advantageous, with a levelized cost of electricity (LCOE) of $0.18/kWh, compared to the $0.46/kWh of the current conventional power system. Additionally, adopting this new system could reduce carbon emissions by 37,326 kg/year, contributing to a more environmentally friendly scenario. This research serves as a model for deploying similar systems to power telecom towers effectively in remote areas globally, particularly in the Middle Eastern region.

Source

Prepared by: Mohammed Al Essa

2. A Review of Modern Wind Power Generation Forecasting Technologies

Wen-Chang Tsai, Anna Holcombe, Chia-Sheng Tu, Whei-Min Lin, Chiung-Hsing Chen

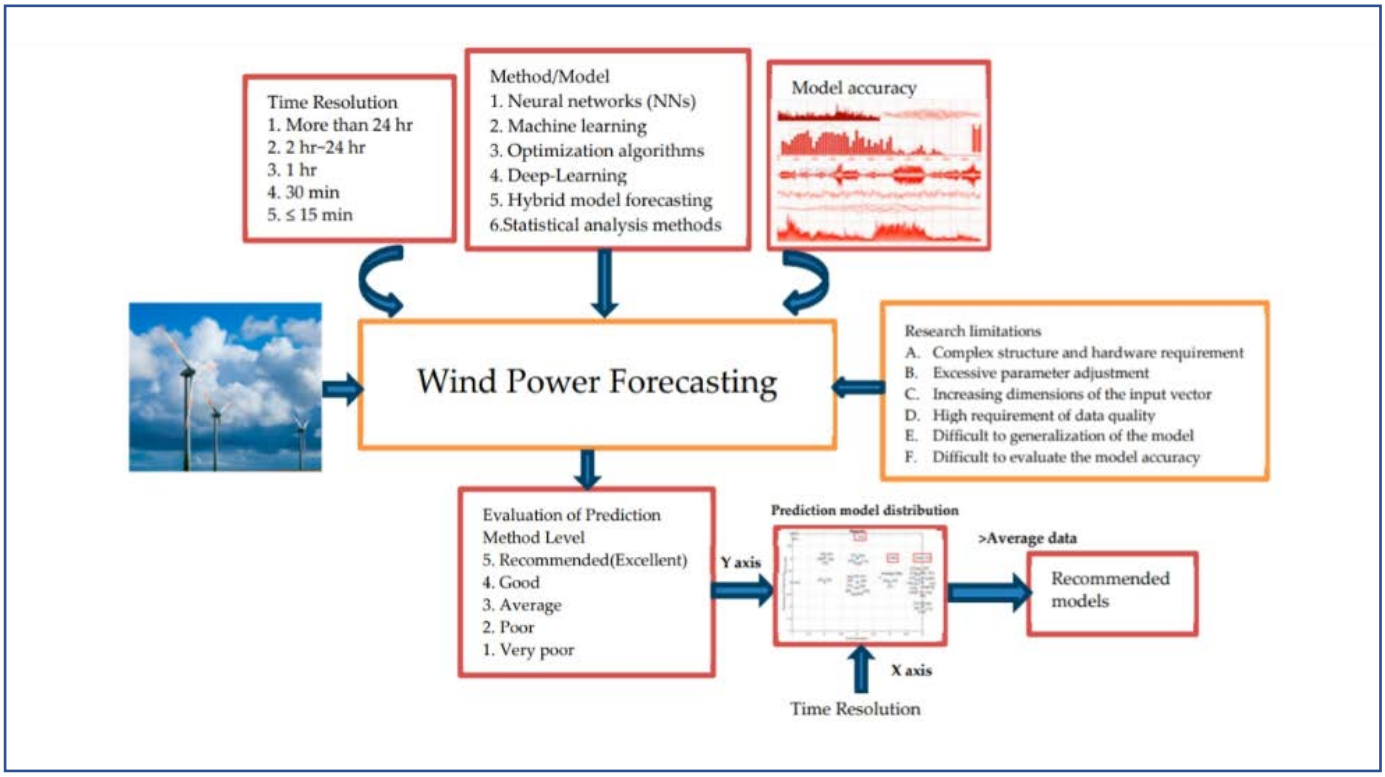


Figure 3. The evaluation structure of wind power forecasting.

In the realm of power grid dispatching and energy distribution, the prediction of wind power output plays a crucial role. Currently, wind power output predictions heavily rely on historical data analysis through fitting and regression techniques. However, medium- and long-term predictions often exhibit significant deviations due to the inherent uncertainty associated with wind power generation. To address this challenge and enhance the accuracy of short-term wind power predictions, it is imperative to develop models that leverage advanced algorithms to study wind power generation systems.

This review highlights the advancements in wind power forecasting technologies, outlining the strengths and weaknesses of various forecasting models. These models, equipped with real-time weight updates and diverse forecasting capabilities, show promise in improving the overall accuracy of wind power predictions and have significant potential in the field of wind power generation forecasting. Moreover, the review examines case studies and examples from existing literature that focus on accurately predicting ultra-short-term and short-term wind power generation under conditions of uncertainty and randomness. Finally, the review offers insights into future research directions, providing valuable guidance for researchers embarking on similar studies and investigations.

Prepared by: : Fahad Al Harbi

Source

Final disposal of radioactive waste in deep geological formations

Status update in different countries worldwide

Iacob Madaci

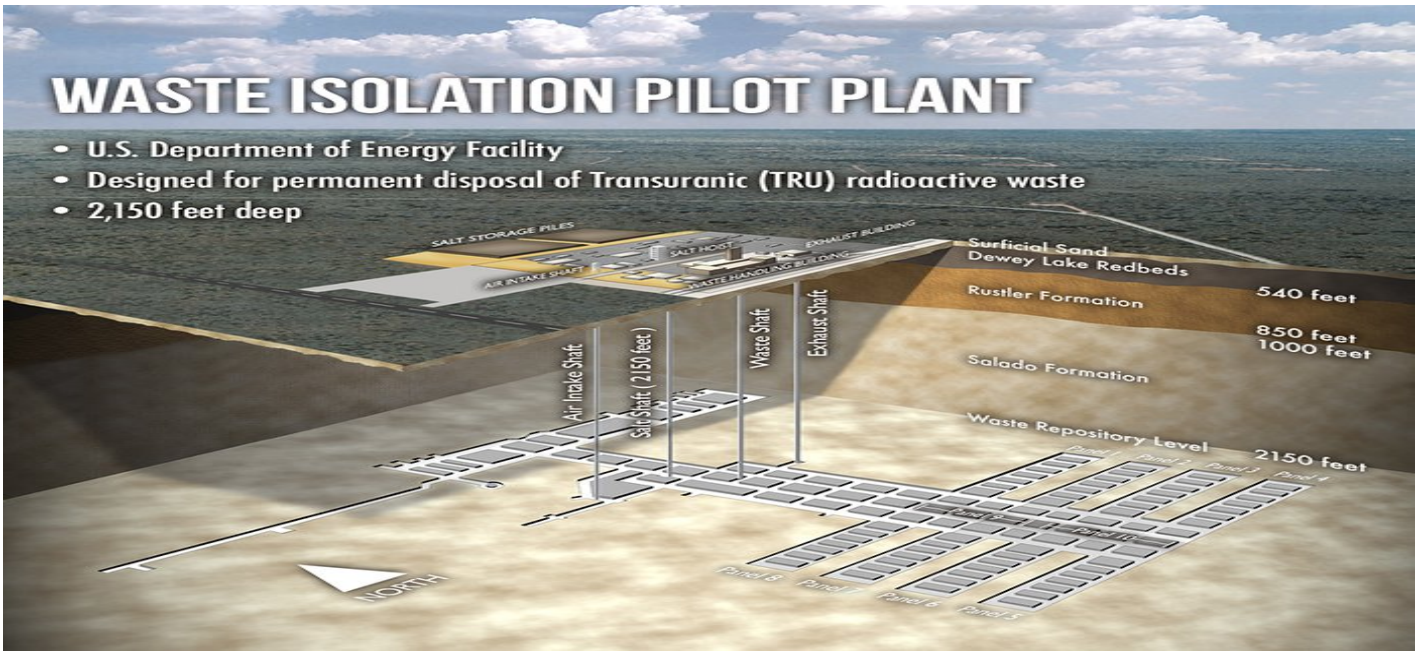
In March 2024, the Waste Isolation Pilot Plant (WIPP) located in the USA, completed 25 years of operation. This facility is the first and only deep geological repository in the world for the final disposal of nuclear waste related to the defense industry. Meanwhile, several media are announcing the imminent start of operation of the Onkalo facility in Finland, which will soon be the first deep geological repository in the world for civil nuclear waste.

This is the occasion to draw a quick overview of the conceptual design of such repositories and update the current progress of their implementation in different countries.

WIPP (USA)

The WIPP is a final repository for defense-related nuclear waste containing transuranic elements (mostly plutonium). It took 25 years to site, license, and build the facility before operations began in 1999. The concept involves disposal rooms buried 655 m underground, in a thick deposit of salt. The waste consists of contaminated materials conditioned in drums and special containers, accumulated since the 1940s.

An equivalent solution is needed for other existing waste inventories of long-lived radionuclides, including over 11,000 tons of high-level radioactive waste (HLW) from the nuclear weapons program and over 90,000 tons of spent nuclear fuel (SNF) from the nuclear power plants (NPPs).



Onkalo (Finland)

The Onkalo facility developed by Posiva is reportedly nearing the start of its operational phase, 24 years after the project was approved. Onkalo will be the final repository for the SNF currently in interim storage on the different NPPs. The SNF will be encapsulated in canisters that will serve as the first containment barrier. The second containment barrier will be made of bentonite, a water-absorbing clay that will fill the storing positions around the canisters. These storing positions are dug 450 m underground, in a very stable bedrock constituting the third containment barrier. The site is sized to accept up to 3,000 canisters, enough for all SNF produced by Finland's five NPPs in their entire life cycles. The site is expected to hold the SNF safely for the next 100,000 years.

Other countries

Other nuclear countries worldwide have reached different stages in their own strategies. In Sweden, a concept similar to Onkalo was approved in 2022. It will take 10 years to build the facility after all permits and licenses have been granted. In France, the license is expected around 2025, after which the construction may take approximately 10 years. Meanwhile, the national utility EDF is currently engaging with external stakeholders to build a large interim storage (basin-type) for its SNF. In Belgium, the Government adopted the principle of a deep geological repository in 2022. Meanwhile, the SNF is stored on the NPP sites in wet basins and in dry casks. In Lithuania, the location for the geological disposal facility is expected to be approved by 2047, while the construction and commissioning of the facility is foreseen in 2068. The concept is similar to Onkalo. In Germany, the need for a deep geological repository was officially announced but concrete steps are yet to be taken.

Perspectives for KSA

Considering the extensive timelines mentioned above, and the expected date of entry of Saudi Arabia in the nuclear energy club, the Kingdom has sufficient time to benefit from other countries' experience and make the best decisions in a timely manner for the final disposal of its future HLW and SNF. In the meantime, decisions in principle should be made regarding the interim storage and the potential reprocessing of SNF.

Workshop on the Design Safety Assessment of Transport Packages Containing Radioactive Material

4 – 8 Mar 2024 , Vienna, Austria

Source

Waste Management Conference 2024 (organized in cooperation with the IAEA)

The WM Symposia will be hosting the Waste Management Conference (WM2024 Conference), organized in cooperation with the International Atomic Energy Agency which will take place live in Phoenix, Arizona, United States of America from 10-14 March 2024. .

10 – 14 Mar 2024 , Phoenix, AZ, United States of America

Source

Technical Meeting on Experience in Removal of High Enriched Uranium from Research Reactors

ICONS 2024 will provide a global forum for ministers, policymakers, senior officials and nuclear security experts to discuss the future of nuclear security worldwide, whilst providing opportunities for exchanging information, sharing best practices and fostering international cooperation.

11 – 14 Mar 2024, Budapest, Hungary

Source

Organizational Meeting for the Eighth Review Meeting of the Contracting Parties to the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management

The Organizational Meeting for the Eighth Review Meeting of the Contracting Parties to the Joint Convention will take place at the IAEA Headquarters in Vienna, Austria, from 27 to 28 March 2024.

27 – 28 Mar 2024 ,Vienna, Austria

Source

Workshop on Techniques and Technologies Used for the Characterization of Radioactively Contaminated Land

The IAEA will hold a Training Workshop on Techniques and Technologies Used for the Characterization of Radioactively Contaminated Land at the UKHSA Training Centre, Harwell Campus, United Kingdom from 8 to 12 April 2024.

Virtual attendance is not possible. Contaminated sites and areas requiring environmental improvement exist across the world. Critical to ensuring their remediation and reuse is the ability to characterize the site before, during and after site works.

8 – 12 April 2024, Harwell, United Kingdom of Great Britain and Northern Ireland

Source

International Conference on Enhancing the Operational Safety of Nuclear Power Plants

The International Atomic Energy Agency (IAEA) fosters an exchange of information on factors impacting operational safety performance of nuclear power plants in areas such as: leadership and safety culture,

15–19 April 2024, Beijing, China

Source

Intersolar Middle East

Intersolar Middle East is held in Dubai World Trade Centre Dubai on 16 to 18 April 2024 showing the companies news of United Arab Emirates and internationals related to sectors Solar energy, Renewable energies.

April 16–18, 2024, Dubai World Trade Center

Source

6 EVENTS

26th World Energy Congress 2024

The 26th World Energy Congress is a critical turning point for leadership on clean and inclusive energy transitions worldwide and an opportunity to spring forward in redesigning energy for people and planet.

22-25 April 2024, Rotterdam, Netherlands

Source

Regional Workshop to Coordinate the Implementation of Integrated Nuclear Security Sustainability Plans

States in the Pacific and Indian Ocean Islands have requested the regional workshop, which is being held in response. This request is related to the national Integrated Nuclear Security Sustainability Plan (INSSP) finalization or review missions. In order to promote interaction amongst participants and investigate possible regional strategies or action plans for improving INSSP Implementation, the workshop will incorporate group discussions.

22 – 26 Apr 2024 , Vienna, Austria

Source

International Conference on Nuclear Security: Shaping the Future

ICONS 2024 will provide a global forum for ministers, policymakers, senior officials and nuclear security experts to discuss the future of nuclear security worldwide, whilst providing opportunities for exchanging information, sharing best practices and fostering international cooperation.

20-24 May 2024, Vienna, Austria

Source

Nuclear Innovation Conference

The Nuclear Innovation Conference 2024 (NIC2024), hosted by NRG|PALAS in collaboration with the IAEA, emphasizes the importance of nuclear energy in achieving energy security and meeting climate goals. The conference aims to facilitate collaboration to address the evolving landscape of nuclear energy. Seeks to bring together key players in the nuclear industry, fostering collaboration and showcasing high-potential initiatives. The content of the conference, supported by NRG|PALLAS's expertise and partnerships, reflects a collective vision for a sustainable future in nuclear energy. Participants can engage in presentations and discussions with global representatives from energy utilities, vendors, regulators, and other stakeholders, providing a unique opportunity to expand networks and contribute to the progression of nuclear energy.

5-6 June 2014, Amsterdam, Netherlands

Source

International Conference on Nuclear Knowledge Management and Human Resources Development

The International Atomic Energy Agency (IAEA) is organizing the Nuclear Knowledge Management and Human Resources Development Conference in response to challenges and opportunities in the evolving global nuclear landscape. The event aims to address the need for a knowledgeable and experienced multigenerational workforce in the nuclear industry, emphasizing the importance of preserving and transferring knowledge as experienced professionals approach retirement. The conference will review global developments, discuss challenges and opportunities, and provide practical solutions for organizational, national, and international levels. Targeting professionals from various sectors, the conference will focus on sustainability by following 'green meeting' guidelines, incorporating paper-smart documentation, waste reduction, and environmentally friendly catering.

1-5 July 2024, Vienna, Austria

Source

International Conference on Nuclear Knowledge Management and Human Resources Development

The International Atomic Energy Agency (IAEA) is organizing the first International Conference on Small Modular Reactors (SMRs) and their Applications in Vienna, Austria, from October 21 to 25, 2024

21–25 October 2024, Vienna, Austria

Source